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14. ABSTRACT

During this reporting period, we have focused on completing the proposed case-control and survival analyses corresponding to Specific Aims 1 and 2. We have found a nearly 1.5-fold increased rate of death among cases living in the lowest neighborhood socioeconomic status (SES) quintile compared to those in the highest quintile; individual-level education and other prognostic factors did not impact these associations. With regards to prostate cancer risk, we found a two-fold increase in the odds of both localized and advanced prostate cancer comparing the lowest to highest neighborhood SES quintiles; individual-level education and other prostate cancer risk factors did not impact these associations. The addition of distinct neighborhood factors (population density, traffic density, residential mobility, and the retail food environment) did little to mediate the effects of neighborhood SES on survival, but resulted in a mediating effect on risk both education and neighborhood SES among localized cases, but not among the advanced cases. We have recently received approval for a 9-month no-cost extension and will be focusing on writing up these results in scientific manuscripts.

15. SUBJECT TERMS
Race, ethnicity, prostate cancer, contextual factors, social environment, built environment, neighborhood

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INTRODUCTION

The objective of this study is to measure the independent and joint effect of individual-level factors and contextual-level social, built, medical access, and immigration environments on prostate cancer survival and risk within racial/ethnic groups and how these effects contribute to socioeconomic and racial/ethnic disparities. The specific aims are to: 1) quantify the independent and joint effects of individual-level education and contextual-level socioeconomic status (SES) on prostate cancer-specific and overall survival within racial/ethnic groups, and the extent to which behavioral and established prognostic factors contribute to these effects; 2) examine the extent to which individual-level education and contextual-level SES explain racial/ethnic variation in prostate cancer-specific and overall survival; 3) quantify the independent and joint effects of individual-level and contextual-level immigration and acculturation factors on prostate cancer-specific and overall survival in Hispanic men, and the extent to which behavior and prognostic factors contribute to these effects; and 4) explore the independent and joint effects of individual-level education and contextual-level SES on prostate cancer risk within racial/ethnic groups. The survival analyses (Aims 1-3) will utilize a proportional hazards regression framework with random effects ("frailty models") while the case-control analyses (Aim 4) will use multilevel unconditional logistic regression models utilizing individual-level and neighborhood-level information.

BODY

The original Statement of Work for the three-year study is as follows:

Task 1. Study and data set-up.
- 1a. Obtain IRB approvals (months 1-6)
- 1b. Determine interview data comparability and compute derived variables (months 1-6)
- 1c. Clean addresses of cases and controls (months 1-3)
- 1d. Transmit data to Cockburn USC lab for geocoding (months 4-6)
- 1e. Prepare contextual data (months 1-6)
  - prepare existing social and built environment datasets
  - collect business and destinations data
  - collect medical facilities data
    - collect OSHPD hospital utilization data, create bed size and ownership variables
    - compute % race/ethnicity in each hospital, based on registry data
- 1f. Append interview data to contextual data (months 7-9)
- 1g. Compute distance and travel time to facilities in GIS (months 10-12)
- 1h. Compute distance buffers in GIS for determining distance to businesses (months 10-12)
- 1g. Merge case data to California Cancer Registry (CCR) data to obtain most updated follow-up information (months 10-12)

Deliverables: Multilevel datasets for conducting analyses relevant to specific aims.

Task 2. Conduct analyses for Aim 1: survival analyses.
- 2a. Conduct analyses for Aims 1a & 1c (months 13-18)
- 2b. Conduct analyses for Aim 1b (months 19-24)
- 2c. Prepare and submit manuscript(s) describing results from Aim 1 (months 19-28)

Deliverables: Completed analyses and manuscript(s) for Specific Aim 1.

Task 3. Conduct analyses for Aim 2: case-control risk analyses.
- 3a. Conduct case-control analyses (months 29-32)
- 3b. Prepare and submit manuscript describing results from Aim 2 (months 33-36)

Deliverables: Completed analyses and manuscript for Specific Aim 2.

PROGRESS

To date we have completed all of the above tasks except for 2c and 3b, as outlined in the above Statement of Work. We have completed our analyses pertaining to Aims 1 and 2 and describe here our major findings.

Aim 1: In a stage-stratified Cox proportional hazards survival analysis of 1800 cases from both centers, after adjusting for race/ethnicity and individual and tumor characteristics, significant effects were observed between neighborhood SES (nSES) and both overall and prostate cancer specific survival. In models containing both education and nSES, the relationship comparing those with a high school diploma or less to college graduates had increased risk of all-cause death (HR=1.32, 95% CI = 1.05-1.67) while a significant relationship with prostate cancer specific deaths was not observed. The relationship comparing the lowest quintile of nSES to the highest quintile was significant for overall survival (HR=1.56, 95% CI = 1.11-2.19) and prostate specific survival (HR=1.85, 95% CI =1.07-3.20); in addition, a significant trend (p-value = 0.02 for both all-cause and prostate cancer specific survival) was observed where by decreasing nSES was highly associated with increased hazard. The addition of distinct neighborhood environment variables (for example: population density, traffic density, residential mobility, and the retail food environment) did little to mediate the effects of nSES and education on either all-cause or prostate cancer survival.

Aim 2: In the case-control analysis of 208 localized prostate cancer cases, 567 advanced prostate cancer cases, and 542 matched controls, more than a two-fold increase in risk of prostate cancer was detected (localized: OR=2.15, 95% CI = 1.11-4.18; advanced: OR=2.26, 95% CI =1.35-3.78) comparing the highest quintile of neighborhood SES (nSES) compared to the lower quintiles (Q1 and Q2 were aggregated due to sample sizes). The relationship between education and advanced prostate cancer was in the opposite direction than nSES such that higher levels of education had decreased risk (OR = 0.67, 95% CI = 0.47-0.97) when comparing college graduates to those with a high school diploma or less education; within localized disease the same relationship was observed but not at a statistically significant level. The study was limited to the participants in the Northern California center due to a difference in matching methods of cases to controls in the two center locations. The Los Angeles site used neighborhood walking to match controls which made the study of neighborhood effects impossible, whereas the SF Bay Area site used random digit dialing. The inclusion of distinct neighborhood environment variables (for example: population density, traffic density, residential mobility, and the retail food environment) in the case-control analyses resulted in a mediating effect on both education and nSES among localized cases; however, no such mediating effect occurred in the advanced cases such that education and nSES remained statistically significant risk factors.

KEY RESEARCH ACCOMPLISHMENTS

- compiled interview data from the two studies; harmonized interview data
- cleaned and geocoded addresses of cases and controls using parcel-based method at the USC GIS lab
- assembled neighborhood data, including neighborhood attributes based on geographic network buffers
- conducted case-control and survival analyses of neighborhood SES as main effect of interest; found significant effects
- conducted case-control and survival analyses to determine the extent to which distinct neighborhood characteristics including population density, residential mobility, retail food environment, traffic density contributed to the neighborhood SES main effects

REPORTABLE OUTCOMES

- Assembled data system of neighborhood variables
- Results from case-control and survival analyses modeling neighborhood socioeconomic status (SES) as the main effect

- Results from analyses of distinct neighborhood characteristics

CONCLUSIONS

We are on task with respect to the Statement of Work and plan to focus the next nine months on writing up the results from the SES case-control and survival analyses.

REFERENCES

None.

APPENDICES

None.